

THE CLAIMS:

None of the claims are amended herein. However, for the convenience of the Examiner, all the pending claims are shown below, in their current form.

1. (PREVIOUSLY PRESENTED) An optical transmission system comprising:
 - an optical transmitter transmitting a WDM optical signal including a plurality of optical signals with different wavelengths;
 - a multi-stage optical amplifier, having an input and an output, amplifying the WDM optical signal received from the optical transmitter through the input with substantially equal gain with respect to the wavelengths of the plurality of the optical signals and for outputting the amplified WDM optical signal from the output; and
 - an optical receiver receiving the amplified WDM optical signal output from said multi-stage optical amplifier,
 - said multi-stage optical amplifier including
 - a first-stage optical amplifier, coupled to the input, which amplifies the received WDM optical signal,
 - a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and
 - a second-stage optical amplifier, coupled to the output, which amplifies the WDM optical signal of which level is controlled by the level controller.
2. (PREVIOUSLY PRESENTED) An optical transmission system comprising:
 - a first optical transmission line through which a WDM optical signal including a plurality of optical signals with different wavelengths is transmitted;
 - a multi-stage optical amplifier, having an input and an output, to amplify the WDM optical signal received from the first optical transmission line through the input with substantially equal gain over the wavelengths of the optical signals; and
 - a second optical transmission line through which the amplified WDM optical signal is transmitted, wherein the multi-stage optical amplifier includes
 - a front-stage optical amplifier, coupled to the input, which amplifies the WDM

optical signal to produce a front-stage amplified WDM optical signal,
a level controller which controls a power level of the front-stage amplified WDM
optical signal and outputs a controlled WDM optical signal, and
a rear-stage optical amplifier, coupled to the output, which amplifies the controlled
WDM optical signal to output a rear-stage amplified WDM optical signal from the output.

3. (PREVIOUSLY PRESENTED) An optical transmission system comprising:
 - an optical transmitter transmitting a WDM optical signal including a plurality of optical signals with different wavelengths;
 - a multi-stage optical amplifier, having an input and an output, to amplify the WDM optical signal from the optical transmitter received through the input with substantially equal gain over the wavelengths of the optical signals and to output the amplified WDM optical signal from the output; and
 - an optical receiver receiving the amplified WDM optical signal from the multi-stage optical amplifier, wherein the multi-stage optical amplifier includes
 - a first-stage optical amplifier, coupled to the input, which amplifies the WDM optical signal,
 - a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and
 - a second-stage optical amplifier, coupled to the output, which amplifies the WDM optical signal of which level is controlled by the level controller.

4. (PREVIOUSLY PRESENTED) An optical transmission system comprising:
 - an optical transmitter transmitting a WDM optical signal including a plurality of optical signals with different wavelengths through a first optical transmission line;
 - a multi-stage optical amplifier, having an input and an output, amplifying the WDM optical signal received from the first optical transmission line through the input with substantially equal gain with respect to the wavelengths of the plurality of the optical signals and outputting the amplified WDM optical signal from the output, the multi-stage optical amplifier including
 - a first-stage optical amplifier, coupled to the input, which amplifies the received WDM optical signal,

a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and

a second-stage optical amplifier, coupled to the output, which amplifies the WDM optical signal of which level is controlled by the level controller; and

an optical receiver receiving the amplified WDM optical signal through a second optical transmission line through.

5. (CANCELED)

6. (CANCELED)

7. (CANCELED)

8. (PREVIOUSLY PRESENTED) An optical transmission system according to claim 1, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power level of the amplified WDM optical signal.

9. (PREVIOUSLY PRESENTED) An optical transmission system according to claim 2, wherein the level controller includes a variable optical attenuator which variably attenuates the front-stage amplified WDM optical signal and thereby controls the power level of the amplified WDM optical signal.

10. (PREVIOUSLY PRESENTED) An optical transmission system according to claim 3, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power level of the amplified WDM optical signal.

11. (PREVIOUSLY PRESENTED) An optical transmission system according to claim 4, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power

level of the amplified WDM optical signal.

12. (PREVIOUSLY PRESENTED) An apparatus comprising:

a multi-stage optical amplifier, having an input and an output, amplifying a WDM optical signal including a plurality of optical signals with different wavelengths received from an optical transmitter through the input with substantially equal gain with respect to the wavelengths of the plurality of the optical signals and outputting the amplified WDM optical signal from the output, the multi-stage optical amplifier including

 a first-stage optical amplifier, coupled to the input, which amplifies the received WDM optical signal,

 a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and

 a second-stage optical amplifier, coupled to the output, which amplifies the WDM optical signal of which level is controlled by the level controller.

13. (PREVIOUSLY PRESENTED) An apparatus comprising:

a multi-stage optical amplifier to amplify a WDM optical signal including a plurality of optical signals with different wavelengths with substantially equal gain over the wavelengths of the optical signals, the multi-stage optical amplifier including

 an input through which the WDM optical signal is received,

 a front-stage optical amplifier, coupled to the input, which amplifies the WDM optical signal to produce a front-stage amplified WDM optical signal,

 a level controller which controls a power level of the front-stage amplified WDM optical signal and outputs a controlled WDM optical signal,

 a rear-stage optical amplifier which amplifies the controlled WDM optical signal to produce a rear-stage amplified WDM optical signal, and

 an output, coupled to the rear-stage optical amplifier, from which the rear-stage amplified WDM optical signal is output.

14. (PREVIOUSLY PRESENTED) An apparatus comprising:

a multi-stage optical amplifier to amplify a WDM optical signal including a plurality of

optical signals with different wavelengths from an optical transmitter with substantially equal gain over the wavelengths of the optical signals, the multi-stage optical amplifier including

- an input through which the WDM optical signal is received,
- a first-stage optical amplifier, coupled to the input, which amplifies the WDM optical signal,
- a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier,
- a second-stage optical amplifier which amplifies the WDM optical signal of which level is controlled by the level controller, and
- an output, coupled to the second-stage optical amplifier, from which the WDM optical signal amplified by the second-stage optical amplifier is output.

15. (PREVIOUSLY PRESENTED) An apparatus comprising:

a multi-stage optical amplifier, having an input and an output, amplifying a WDM optical signal including a plurality of optical signals with different wavelengths received from an optical transmission line through the input with substantially equal gain with respect to the wavelengths of the plurality of the optical signals and outputting the amplified WDM optical signal from the output, the multi-stage optical amplifier including

- a first-stage optical amplifier, coupled to the input, which amplifies the received WDM optical signal,
- a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and
- a second-stage optical amplifier, coupled to the output, which amplifies the WDM optical signal of which level is controlled by the level controller.

16. (PREVIOUSLY PRESENTED) An apparatus according to claim 12, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power level of the amplified WDM optical signal.

17. (PREVIOUSLY PRESENTED) An apparatus according to claim 13, wherein the

level controller includes a variable optical attenuator which variably attenuates the front-stage amplified WDM optical signal and thereby controls the power level of the amplified WDM optical signal.

18. (PREVIOUSLY PRESENTED) An apparatus according to claim 14, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power level of the amplified WDM optical signal.

19. (PREVIOUSLY PRESENTED) An apparatus according to claim 15, wherein the level controller includes a variable optical attenuator which variably attenuates the WDM optical signal amplified by the first-stage optical amplifier and thereby controls the power level of the amplified WDM optical signal.